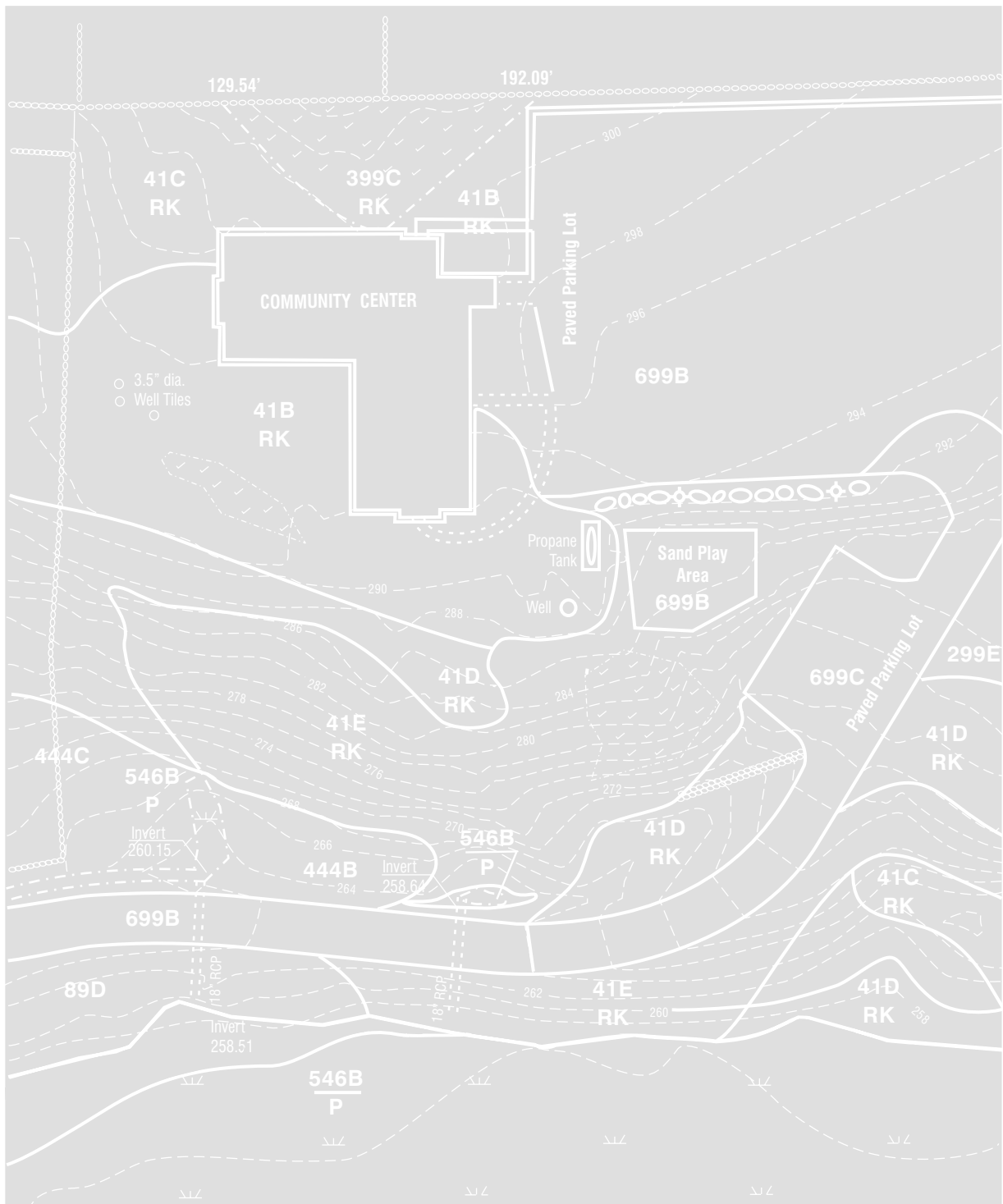


Data Requirements for Site Review: Guidance for Planning Boards

New Hampshire Office of State Planning · May, 1999



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State of New Hampshire,
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New Hampshire Department of Environmental Services,
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May, 1999

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DATA REQUIREMENTS FOR SITE REVIEW: GUIDANCE FOR PLANNING BOARDS

I. Introduction

This report presents a set of guidelines for State and local government in New Hampshire concerning the subdivision and use of land. The impetus for this report came from the release by the Soil Scientist Society of Northern New England (SSSNNE) of new site specific soil mapping standards (SSSMS) in June, 1997. Questions were raised about these standards, the accuracy of field methods, when the standards should be required, and their relation to the previous high intensity soil mapping which has been required by many New Hampshire communities. In response to these questions, the Office of State Planning (OSP) and the Department of Environmental Services (DES) invited representatives from a number of professional organizations and governmental agencies to come together to develop uniform land use planning and regulatory guidelines for municipalities which would have a broad base of support.

Members of the following organizations and interests served on the Committee:

NH Department of Environmental Services: *William E. Evans, P.E. and Karla McManus*

NH Office of State Planning: *Jeff Taylor, Jim McLaughlin and Francesca Latawiec*

Granite State Designers and Installers Association: *Alden Beauchemin, Charles Pearson, Richard Clough, Ken Bradley and Carl Sherblom*

NH Water Council: *Rep. David Kibbey*

Natural Resources Conservation Service: *Steve Hundley*

NH Municipal Association: *Susan Slack*

Rockingham Planning Commission: *Glenn Greenwood*

Rockingham County Conservation District: *Mary Currier*

NH Association of Conservation Districts: *John Hodsdon and Robert Ward*

NH Association of Conservation Commissions: *Marge Swope*

NH Board of Natural Scientists: *Tim Ferwerda*

NH Association of Consulting Soil Scientists: *Larry Morse*

NH Association of Wetland Scientists: *James Gove*

Private soil and wetland consultants: *Peter Schauer and Dave Allain*

Homebuilders Association of NH: *Steve Lewis*

The Committee met every two weeks during the spring and summer of 1998 with the objective of preparing this document and presenting its findings at the OSP Planning Conference on November 14, 1998.

Among the observations and concerns that surfaced during the deliberations of this Committee were the following:

- **Lack of consistency between local and State requirements.** Certain towns require High Intensity Soil (HIS) maps as the basis for soil-based lot sizing. The NHDES under RSA 485-A requires soils maps based on the National Cooperative Soil Survey (NCSS) standards as part of the permitting process for subdivision and subsurface wastewater treatment systems. HIS maps do not conform to NCSS standards and are therefore not acceptable for NHDES' permit requirements.

Another example of inconsistency between levels of government is the definition and delineation of wetlands. Many towns use poorly and/or very poorly drained soils to define wetlands for local zoning purposes. The State Wetlands Bureau uses the 1987 Army Corps of Engineers Manual, which calls for delineation of wetlands according to three parameters: hydric soils, hydrophytic vegetation and wetland hydrology. Hydric soils are further determined in accordance with the 1998 Field Indicators for Identifying Hydric Soils in New England prepared by the New England Interstate Water Pollution Control Commission (NEIWPCC).

- **Consistency in permitting requirements within the Department of Environmental Services.** NHDES should strive to make the definitions and standards used by its various bureaus consistent across the entire department.
- **Improvements in our understanding of natural processes and methods.** As new scientific data, standards and methods are developed, it is important that this information be transmitted to municipalities for use in making land use decisions. For example, the Site Specific Soil Mapping Standards (SSSMS) are consistent with National Cooperative Soil Survey standards. Thus, a site specific map prepared in accordance with SSSMS for local approval processes would also be acceptable for NHDES Subsurface approval. A SSS map would also be consistent with the regional field indicators for identifying hydric soils and the soils identification portion of the delineation of federal jurisdictional wetlands.
- **Different requirements from one town to another in land use regulation.** Town ordinances and regulations affecting land use - zoning, site plan, subdivision, health ordinances - vary widely in terms of the requirements placed on developers and land owners. While this diversity is to be expected, given the unique history, natural setting, and cultural values of each of the 234 communities in New Hampshire, a consistent approach to soils mapping and wetland delineation requirements is desirable.
- **Inconsistent requirements within a town's ordinances and regulations.** This observation concerns the inconsistency that sometimes occurs where different and, at times, conflicting definitions, standards or requirements are present within a set of municipal land use regulations and ordinances.

II. Committee Findings

The Committee developed a goal which guided its deliberations and can be summed up in the following Statement: ***“In order to streamline the process and avoid confusion, put together a reasonable, comprehensive guideline that addresses soil and wetland related natural resource issues with regard to subdivisions, wastewater disposal systems, lot size criteria, general development and other uses.”***

A number of findings were adopted by the Committee as the basis for its recommendations:

- There is increasing development pressure on less suitable land, especially in the southeast portion of State. As development has progressed, the better, more easily developed lands have tended to undergo conversion to residential and commercial uses. During subsequent rounds, less suitable lands have become candidates for development. Often these parcels contain wetlands, steep slopes, rock outcrops, soils with bedrock within 18 inches of the soil surface, and other features that present difficulties for building, road and other construction activities.
- State and local authorities should regulate development so that natural resources are protected, including surface water and groundwater resources. As growth pressures begin to turn toward the more difficult parcels, these same tracts of land often contain natural resources that ought to be protected. At a minimum, State and local regulations should require these resource areas to be shown on any development proposal.
- State and local authorities should allow available resource information to be employed in the permit application/review process, if the data is at an appropriate scale and level of detail to make land use decisions for the proposed intensity of development. The generalized data should be verified by on-site investigations to corroborate that the existing information is valid for the site and that it meets US Department of Agriculture/NRCS/NCSS or other established standards.
- State and local authorities should strive for consistency in terms of resource definitions, sources of information, and standards for field measurement/verification of required data.
- The Committee recommends the following as the best available guides for on-site resource characterization and mapping, consistent with State statutes and administrative rules:

Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, Environmental Laboratory, Department of the Army, 1987;

Field Book for Describing and Sampling Soils: Version 1.1 National Soil Survey Center, NRCS, 1998;

Field Indicators for Identifying Hydric Soils in New England, Version 2, New England Interstate Water Pollution Control Commission, 1998; and

Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999;

- State and local authorities should require the certification or permitting of qualified professionals capable of preparing on-site information for development proposals as essential steps to protect the public and the environment.

- Professional organizations and State and regional planning agencies should cooperate to provide consistent, defensible, science based advice to municipalities on regulatory standards.
- Land use regulations often require that all applicants adhere to the same requirements, regardless of the size, extent or nature of the proposal. There appears to be a need for flexibility in the level of information required, depending on the circumstances of the land in question and the proposed use. This document provides guidance to communities in deciding on the appropriate level of information to require of an applicant.
- The NH Department of Environmental Services should revise its rules to incorporate standards for confirmation of an NRCS soils map and for the identification of limiting physical features on a site.

III. Summary Guidelines for Required Information

This document recommends the type of information about a site's physical characteristics that should be required of applicants for subdivision or site plan review approval. Every proposal has unique site characteristics, including both amenities and limitations for development. Therefore, it is appropriate to tailor the information required about a site to match the physical attributes and proposed intensity of development for that parcel.

- In all cases the planning board should require that wetlands and surface waters be delineated for the proposed site. An emphasis should be placed on avoiding or minimizing the impacts of disturbance on these resources.
- Where intense development is proposed it is appropriate to require the detail of a site specific soil (SSS) map. Such a map will help both the applicant and the planning board to identify areas with limitations for site development as well as areas that are suitable for locating structural improvements. Three criteria are offered to measure development intensity sufficient to warrant a site specific soil map:
 - Areas with average lot sizes less than two acres, without municipal water and sewer;
 - Areas with average lot sizes less than one acre, with municipal water but without municipal sewer;
 - Areas with less than 20,000 contiguous square feet of land that is not wetland and does not have any limiting physical features and without municipal water and sewer; and
- Furthermore, areas without water and sewer with soil complexes with dramatically different characteristics should require a SSS map.

If any of these criteria applies to a development proposal, the applicant should submit a site specific soil map and the planning board is justified in requiring it.

Where larger lots or low intensity of development is proposed, the level of detail provided by a site specific soil map may not be necessary. The planning board may be able to make an informed decision on such applications based on the NRCS county soil survey maps. In these instances, the planning board should require the applicant to provide evidence that the site conditions reflected in the NRCS mapping are corroborated by on-site soils investigations. If the evidence is consistent with the

NRCS data, then this level of information may be adequate for planning board review. If the evidence is not consistent, or if limiting physical features are identified on the site which would affect its use, then the planning board must decide if a site specific soil map is required. Limiting physical features include rock outcrops, soils with bedrock within 18 inches of the soil surface, steep slopes greater than 35 percent and very poorly drained areas. It should be noted that NRCS county soil maps do not show areas of contrasting soil which are less than 3 to 5 acres in size.

If complicated site conditions are known to be present, an applicant may shorten planning board review time by providing a SSS map at the outset. Similarly, the planning board may require submission of a SSS map if an application meets the development intensity criteria, significant limiting physical features are known to exist on the site, or there are areas without water and sewer with soil complexes with dramatically different characteristics. ***All applicants should take advantage of the opportunity to have preliminary discussions with the planning board, either conceptual consultation or design review, prior to submitting a completed application. This can help the board and the applicant to determine the appropriate level of site specific data to be submitted with the application.***

IV. Information Required for Subdivision and Site Plan Review

This section describes three levels of technical information to be submitted to the planning board by applicants for subdivision or site plan review approval. The intent is to provide the board with guidance as to the type of data needed for making informed land use decisions about developments of different magnitudes and levels of intensity. For each level, the data to be required is specified, as well as the standards to be used in preparing the data and the type of professional qualified to do the work. The following statutes and administrative rules adopted pursuant to them specify which professionals are certified or permitted and qualified to prepare on-site technical information:

- RSA 310-A:76, II states that a certified soil scientist is qualified to identify, classify and prepare soil maps according to NCSS or DES standards.
- RSA 310-A:76, II-a states that a certified wetland scientist is qualified to delineate wetland boundaries and prepare wetland maps in accordance with DES or USACE standards.
- RSA 310-A:79, IV allows a permitted septic designer to determine a hydric soil boundary or test pit evaluation under RSA 485-A:35.
- RSA 485-A:34 requires soil data, consisting of maps and charts prepared by NRCS or equivalent as part of an application for subsurface disposal systems.
- RSA 485-A:35 requires plans and specifications for subsurface disposal systems to be prepared by a septic designer permitted by DES.

Figure 1. is a schematic diagram showing implementation of the review process.

Figure 2. identifies the methods and standards which apply to the information required for each of the three levels of review. It also indicates the type of professionals who may be qualified to provide the information. A list of the full citations of the methods and standards to be used, by review level, is presented on page 25 in the Sources and References section of this document.

Figure 1. Submission Process

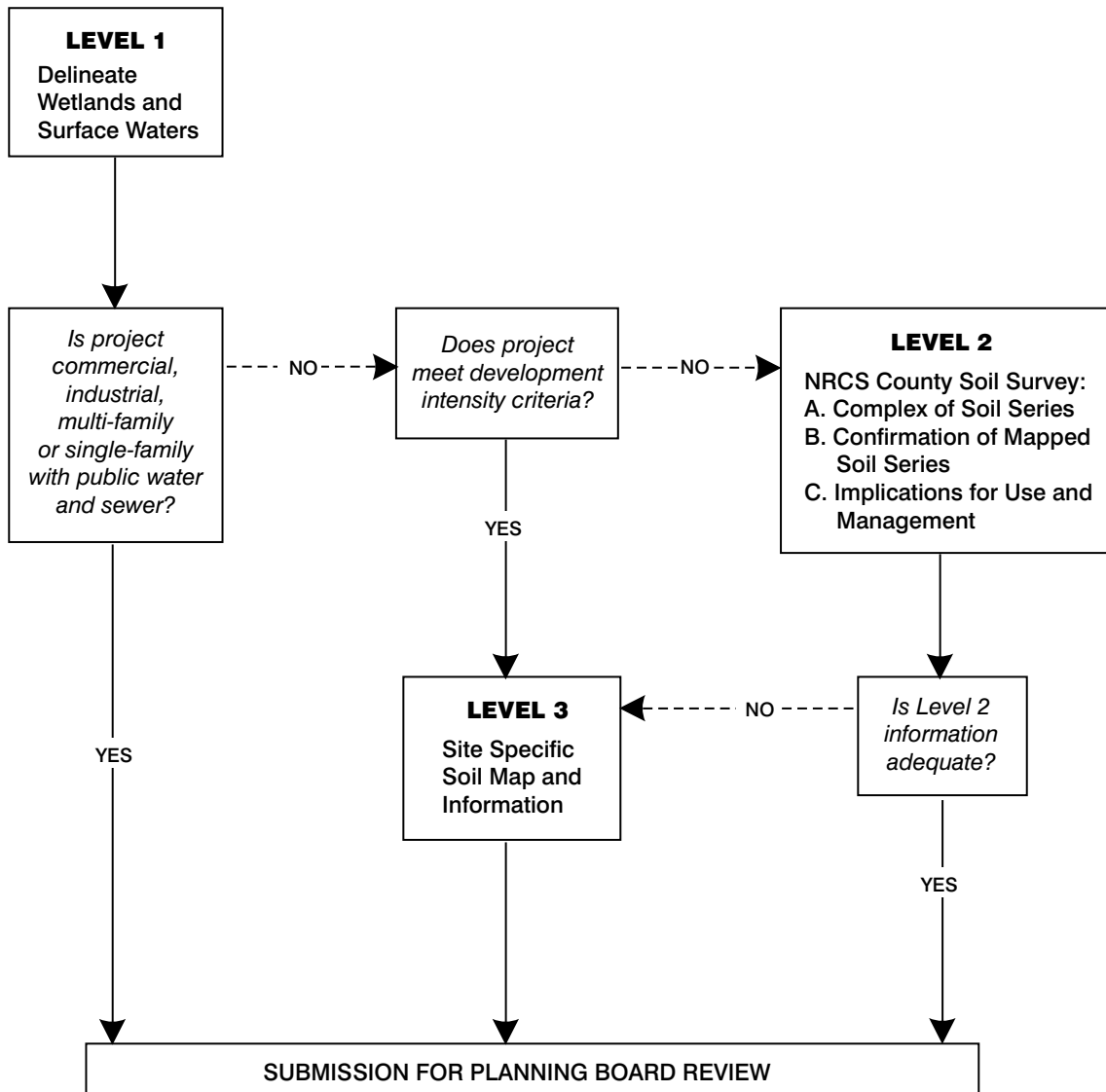


Figure 2. Levels of Information for Subdivision and Site Plan Applications

LEVEL	TASKS	STANDARDS	QUALIFICATIONS
1	Step A. Wetlands Delineation Step B. Surface Waters Delineation	<ul style="list-style-type: none"> • 1987 US Army Corps of Engineers Wetlands Delineation Manual • 1998 Field Indicators for Identifying Hydric Soils for New England • Defined by RSA 485-A:2, XIV 	Certified Wetland Scientist, or Permitted Septic Designer*
2	Step A. Identification of Dramatically Different Soil Complexes Step B. Confirmation of NRCS Soil County Soil Survey Map Step C. Identification of Limiting Physical Features	<ul style="list-style-type: none"> • Appendix 1 of this document. • NRCS Official Series Description Sheets and/or NRCS published map unit descriptions (Steps A-C). • Field Book for Describing and Sampling Soils: Vers. 1.1, 1998 • Site Specific Soil Mapping Standards for NH & VT, 1999 • Keys to Soil Taxonomy, Eighth Edition, 1998 • Same as Step B 	Certified Soil Scientist or Permitted Septic Designer*
3	Site-Specific Soil Map, when: <ol style="list-style-type: none"> a. Average lot size <2 acres, without municipal water and sewer, or b. Average lot size <1 acre, with municipal water, but without municipal sewer, or c. Non-limiting, non-wetland contiguous area <20,000 square feet and without municipal water and sewer, or d. Areas without municipal water and sewer and with soil complexes with dramatically different characteristics. 	<ul style="list-style-type: none"> • Site Specific Soil Mapping Standards for NH & VT, 1999 	Certified Soil Scientist
* Per RSA 310-A:79, IV and NH Code of Administrative Rules Chapters Env-Ws 1000 adopted under RSA 485-A for the purpose of septic system design or subdivision applications.			

LEVEL 1.**Delineation of Wetlands and Surface Waters
For ALL Subdivision and Site Plan Applications**

The first level of information, Level 1, is required of all proposed site plan and subdivision applications. It involves the on-site delineation of wetlands and surface waters existing on the subject property. All plan applications should show the location and extent of wetlands and surface waters on the parcel or parcels under consideration, directly on the plan. Wetland and water body information is intended to demarcate the upland portions of a property on the site. This allows the board to know the location of the more sensitive natural resources and to determine if the development structures are proposed to be sited in or near them.

Level 1 information on wetlands and surface waters shall be provided on a site plan with identification and delineation of the resources in accordance with the definitions and standards specified in Steps A and B, below. The written documentation specified in Step C shall be included on the site plan and be certified by the stamp of a qualified professional.

Step A: Wetlands Delineation

- Chapters Wt 100-800 of the NH Code Of Administrative Rules, April 21, 1997.
- Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, Environmental Laboratory, Department of the Army, 1987.
- Field Indicators for Identifying Hydric Soils in New England, Version 2, New England Interstate Water Pollution Control Commission, 1998.

Step B. Surface Waters Delineation

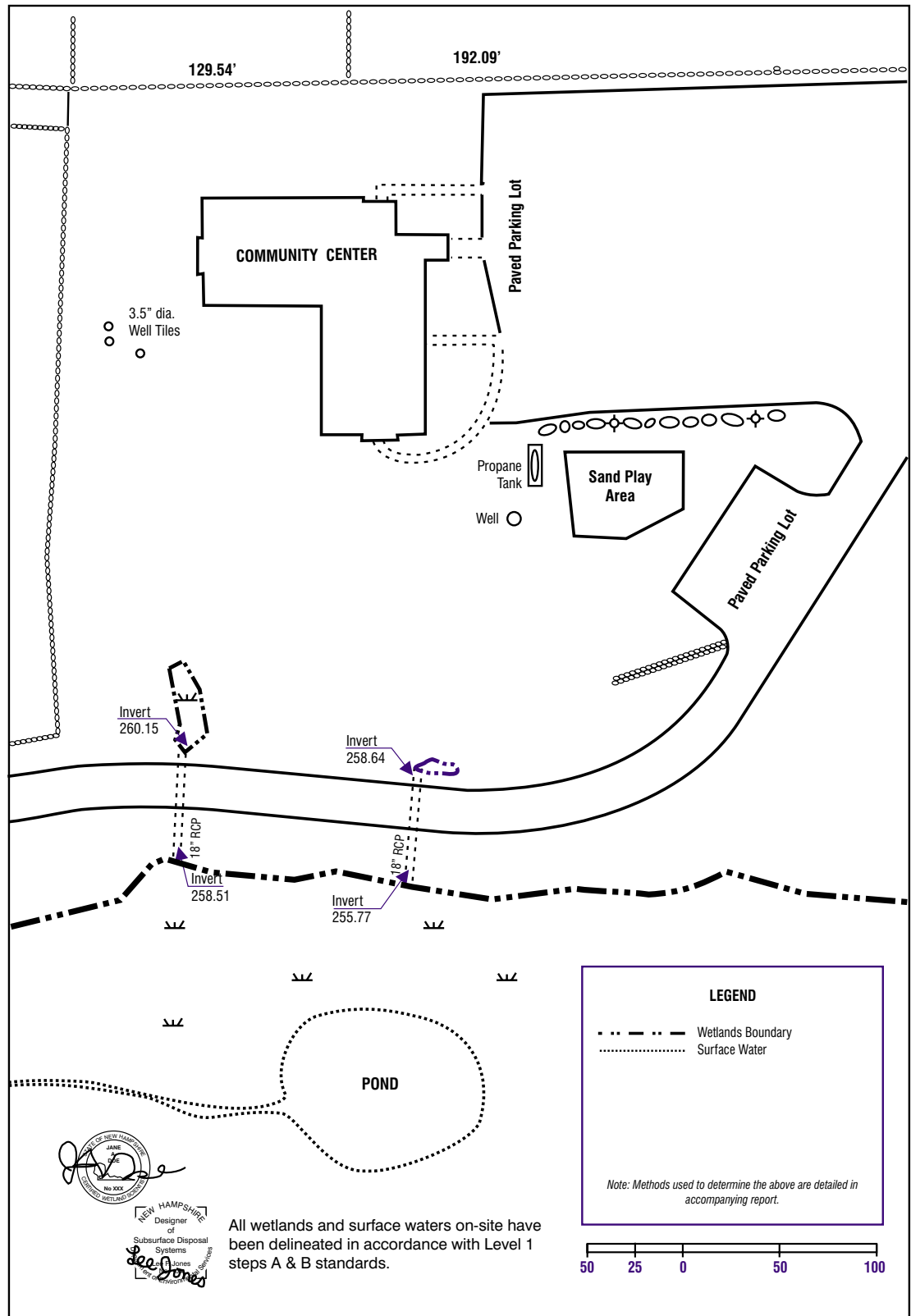
- RSA 485 - A:2, XIV, NH Safe Drinking Water Act.

Step C. Written Documentation

- A written statement on the site plan, **certified by the stamp of the Certified Wetland Scientist (CWS) in accordance with RSA 310:76,II-a or Permitted Septic Designer (PSD)**, in accordance with RSA 310-A:79,IV and NH Code of Administrative Rules Chapters Env-Ws 1000, adopted under RSA 485-A, for the purpose of septic system design or subdivision applications, that all wetlands and surface waters on-site have been delineated in accordance with the standards specified in Steps A and B above.

Figure 3. shows a schematic diagram of a site plan illustrating Level 1 wetlands and surface waters. Note that the sources required by steps A and B above should be cited directly on the site plan.

Figure 3. Schematic Diagram of Level 1 Wetlands and Surface Waters Delineation



Determining the Next Level Based on the Type of Proposal

1. If a project involves commercial or industrial development or residential use which is served by public water and sewer, **the applicant may proceed to file an application with the planning board**. In these cases, since on-site wastewater disposal is not an issue and other limiting features should be mitigated as part of the plan, submission of soils data is at the discretion of the planning board.

Additionally, if the site development calls for structures and/or impervious cover of an area greater than 100,000 square feet, or 50,000 square feet within the protected shoreland, **then the applicant should file a site specific application under RSA 485-A:17, significant alteration of terrain**.

2. If the project meets at least one of the following three development intensity criteria, **then the applicant should proceed directly to Level 3**:
 - lots in a proposed subdivision average less than two (2) acres in area, and are not served by either municipal water or sewer;
 - lots in a proposed subdivision average less than one (1) acre in area, and are served by municipal water, but not sewer; or
 - the non-limiting, upland, contiguous area on any proposed lot without municipal water and sewer is less than 20,000 square feet.

Note: For the purpose of interpreting these criteria, the following definitions apply:

“Average area” means the total acreage of the property, exclusive of very poorly drained soils, divided by the total number of proposed lots. (Use of average area here assumes that all lots are roughly the same size.)

“Non-limiting” means the area, exclusive of very poorly drained soils, rock outcrops, bed-rock within 18 inches of the soil surface and soils with steep slopes greater than 35 percent.

3. **For all other projects, proceed to Level 2.**

If the proposal meets none of the above tests, then Level 2 information is potentially adequate for local review, provided that the NRCS soil survey information is determined to be sufficient for the proposed use and management of the property.

LEVEL 2.**Confirmation of County Soil Survey Maps and Identification of Limiting Physical Features For Plans with Larger Lot Sizes or Lower Development Intensity.**

A Level 2 review includes submission of existing data, such as soil maps representing the NRCS county soil survey. For this level, an applicant is required to submit and evaluate detailed soil profile descriptions to corroborate the soil series and map unit determination based on the county soil survey. The procedure for doing this is outlined below.

Step A: Identification of Soil Complexes With Dramatically Different Characteristics

- If any of the soil map units on the property, as mapped by the NRCS county soil survey, is a complex of soils with dramatically different characteristics that would have an impact on use and management of the property, **then the applicant must provide Level 3 information.** (Appendix 1, prepared by the NRCS State Soil Scientist, lists these complex soil map units.)
- If the soils mapped by the NRCS county soil survey is **not** one of these complexes, **continue to Step B.**

Step B: Confirmation of NRCS County Soil Survey Map

The following information is required to be submitted for confirmation of the NRCS county soil survey:

- A copy of the NRCS county soil survey with the subdivision location and approximate boundaries superimposed on the soil map. (Appendix 3, page 34.)
- A representative number of detailed soil profile descriptions to characterize variations in the landscape for each mapped unit, based on NRCS standards. These are to be included in a narrative report for the project. The standards and methodologies for doing this description are listed here. Note that the sources required by step B should be cited directly on the site plan. (Appendix 3, page 34 and Figure 4, page 14.)

Standards

The required tasks specified under Level 2 are to be carried out according to the standards found in the following documents:

- Field Book for Describing and Sampling Soils: Version 1.1 National Soil Survey Center, NRCS, 1998.
- Keys to Soil Taxonomy, Eighth Edition, USDA/NRCS 1998.
- NRCS Official Series Description Sheets and/or published map unit descriptions USDA/NRCS.

Methods

A minimum of one soil profile description shall be completed per soil map unit within the subdivision or site plan area, as depicted on the NRCS county soil survey. The soil will be described in sufficient detail, so as to support or refute that identified properties are within, or similar to those of the soil series used to name the map unit.

Soils descriptions should be carried out in areas suspected of having the greatest likelihood of contrasting soil features. Some map units will require more than one soil description to document soil variability.

The map unit purity standards from Site Specific Soil Mapping Standards for New Hampshire and Vermont Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999, will apply.

- The location(s) of the soil profile description(s) used to corroborate the NRCS soil series shall be shown on the site plan, with a reference to the description(s) in the narrative report for the project.
- A detailed comparison between each soil profile description and the representative pedon (a description of a small three-dimensional area of soil, that is typical of the soil series in the county) for that soil from the county soil survey. The NRCS Official Series Description Sheets and/or NRCS published map unit descriptions for each mapped unit are to be used as references.
- A written statement that the soil profile description(s) from the site adequately reflect the range of characteristics for the series, as described in the county soil survey. The statement shall indicate that the county soil survey adequately represents soil and landscape characteristics, such that site specific land use decisions can be made without further soil investigations. ***This statement is to be certified by the stamp of the CSS or PSD. If this statement cannot be made, proceed to Level 3.***
- A narrative report for the project which summarizes the information compiled in Step B. This shall include a determination of whether limiting physical features are present on the parcel and indicate the specific mapped soil units where these occur. ***If any limiting physical features are identified on-site, then Step C is required.***

Three examples of suggested documentation for NRCS soil map confirmation for Step B are presented in Appendix 3. Note that this information is to be accompanied by a detailed narrative report which explains the documentation.

- If the on-site investigations confirm the nature and properties of the soils as reflected by the soil map, consistent with the intended use and intensity of development, ***a Level 2 review will be adequate for the planning board's purposes.***

Step C. Identification of Limiting Physical Features

If the on-site soil investigations indicate that limiting physical features which have the potential to affect the usability of certain areas for structures, on-site wastewater disposal systems or roads, they must be identified and documented by the applicant.

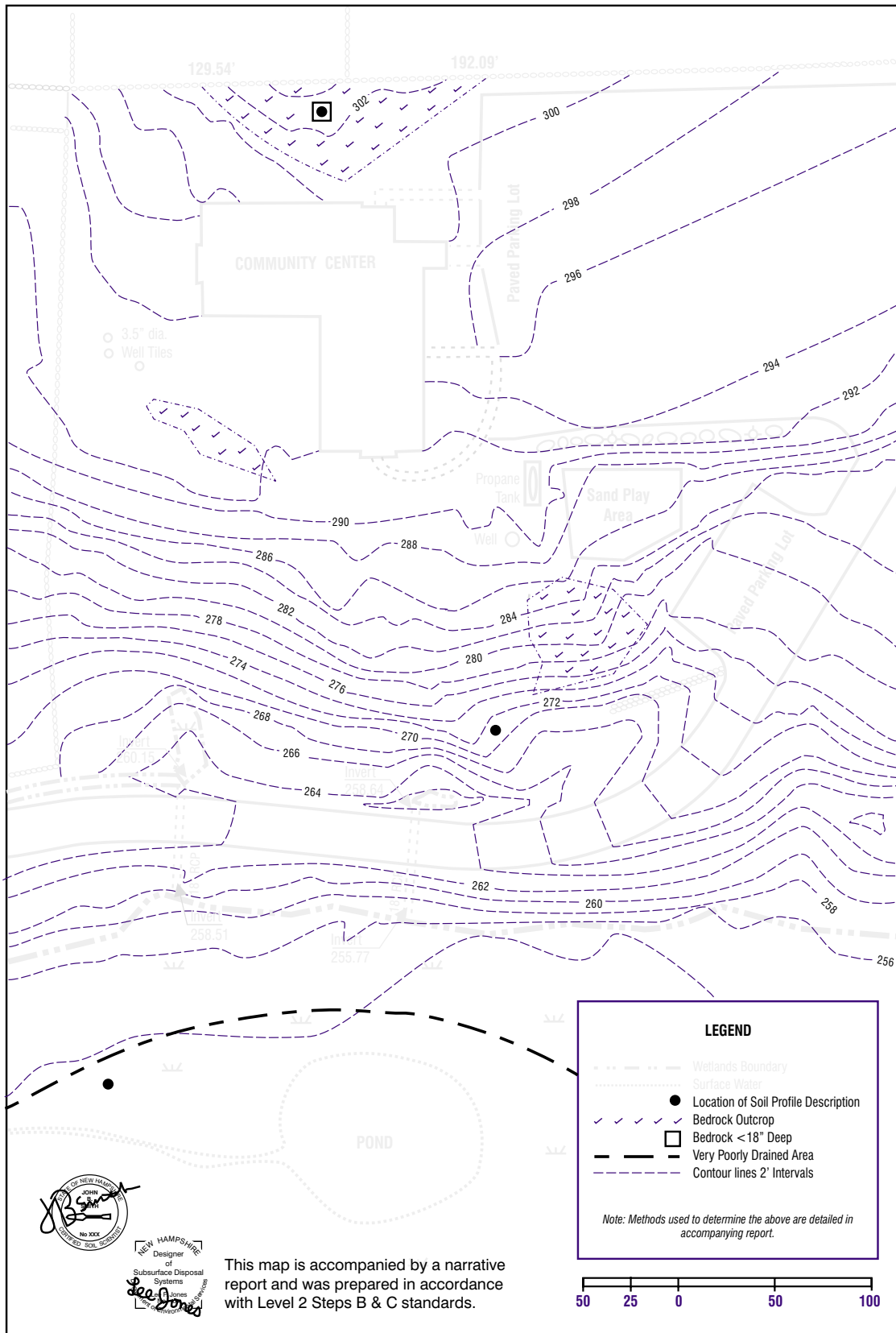
In addition to the information required in Steps A and B, the following information is required for identification of limiting physical features:

- Delineation of the limiting features, specifically rock outcrops, steep slopes > 35%, soils with bedrock within 18 inches of the soil surface and very poorly drained areas on-site. These features are to be shown on the site plan. (The terms used to describe the limiting physical features are defined in Appendix 2)
- A detailed description of each limiting physical feature, based on NRCS standards, in a narrative report for the project, with reference to its location on the site plan. This can either be done as a stand alone document or as an amendment or addendum to the narrative prepared under Step B.
- A written statement that the limiting physical features identified above would not have a significant impact on use and management of the property. ***This statement is to be certified by the stamp of the CSS or PSD. If this statement cannot be made, then proceed to Level 3.***
- A written statement to indicate that the county soil survey adequately represents soil and landscape characteristics such that site specific land use decisions can be made without further soil investigations. ***This statement is to be certified by the stamp of the CSS or PSD. If this statement cannot be made, then proceed to Level 3.***
- A written statement that limiting physical features are present on the parcel(s) and that ***either (1) a SSS Map (Level 3) is required or (2) not required, with supporting documentation for this position. This determination is to be certified by the stamp of the CSS or PSD. If a SSS Map is required, then proceed to Level 3.***

A schematic diagram of a site plan illustrating Level 2 limiting features, identified as part of Step C, is shown in Figure 4. Observe that there are no steep slopes greater than 35% shown in Figure 4, due to the lack of such a limiting feature in this example. Also note that the information shown in Figure 4 is to be accompanied by a detailed narrative report which explains the documentation. The report shall include the three written statements, certified by the stamp of the CSS or PSD, as required by Step C above. Three examples of suggested documentation for NRCS map confirmation are shown in Appendix 3, page 34. Note that the sources required by Step B of Level 2 should be cited directly on the site plan.

- If the on-site investigations confirm the nature and properties of the soils as reflected by the soil map, consistent with the intended use and intensity of development, ***a Level 2 review will be adequate for the planning board's purposes.***

The ultimate decision as to whether or not Level 3 information is required is up to the planning board.

Figure 4. Schematic Diagram of Level 2 Limiting Features

LEVEL 3.**Site Specific Soil (SSS) Map for Intense Development
or Sites With Limiting Features**

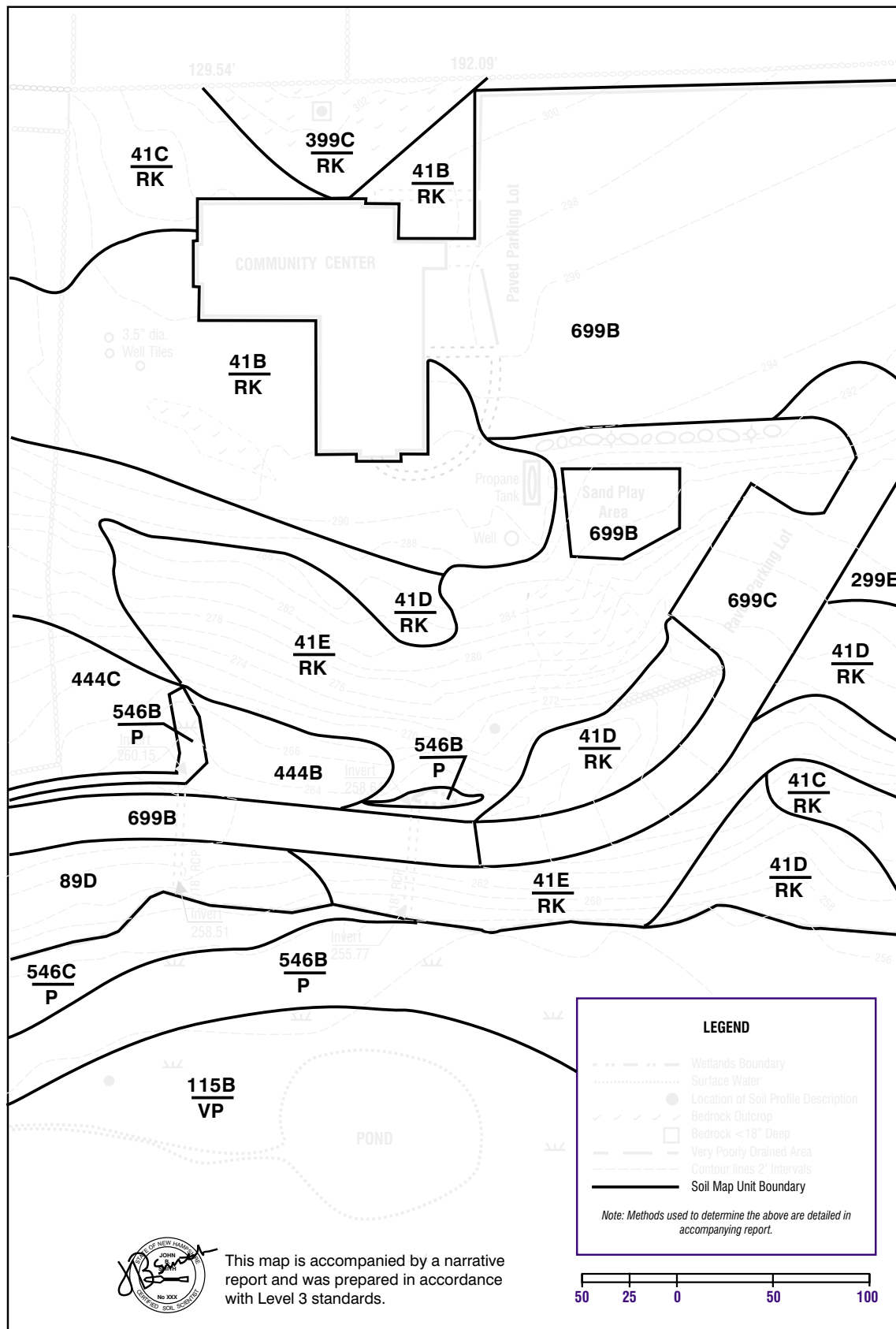
Level 3 requires a site specific soil map prepared in accordance with Site Specific Soil Mapping Standards for New Hampshire and Vermont Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999. ***This is to be certified by the stamp of the CSS.***

A schematic diagram of a Level 3 SSS map is shown in Figure 5. A typical soil map unit key is shown on page 17, along with a map notation that is required to be placed on all site specific soil surveys. Pages 18-21 contain sample pages from a site-specific soil survey report which describe each soil map unit found on the property.

Final Plan

A schematic diagram of a final plan that incorporates all three levels of technical information is shown in Figure 6, page 23.

Figure 5. Schematic Diagram of a Level 3 SSS Map



SITE SPECIFIC SOIL MAP UNIT KEY

Symbol	Map Unit	Slope Class	Drainage Class	HIS Symbol
<u>115B</u> VP	Scarboro mucky loamy sand	0-8%	Very Poorly Drained	611BH
<u>546B</u> P	Walpole sandy loam	0-8%	Poorly Drained	511BH
699B	Urban Land pavement	0-8%	Impervious Surface	363BH
699C	Urban Land pavement	8-15%	Impervious Surface	363CH
444B	Newfields fine sandy loam	0-8%	Moderately Well Drained	321BH
444C	Newfields fine sandy loam	8-15%	Moderately Well Drained	321CH
<u>41B</u> Rk	Chatfield-Hollis Rock Outcrop	0-8%	Well Drained	22XBH
<u>41C</u> Rk	Chatfield-Hollis Rock Outcrop	8-15%	Well Drained	22XCH
<u>41D</u> Rk	Chatfield-Hollis Rock Outcrop	15-25%	Well Drained	22XDH
<u>41E</u> Rk	Chatfield-Hollis Rock Outcrop	25-50%	Well Drained	22XEH

Map Notation: To be Placed On All Site-Specific Surveys

"This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, produced by a certified soil scientist, and is not a product of the USDA Natural Resources Conservation Service. A narrative report accompanies this map and map key.

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 115B
VP

Map Unit Name: Scarboro mucky loamy sand, 0-8% slopes

Landscape Settings: This soil type is found in the concave or nearly level areas of the property.

Surface Features: The areas with this map unit are associated with the wetland that is delineated in the northern section of the property.

Drainage Class: Very Poorly Drained

Parent Material: Organic material overlying sandy glacial outwash.

Complex: Yes () No (☐)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Areas of dissimilar inclusions consist of small areas where the soils are poorly drained mineral soils. This area encompasses no more than 5% of this map unit.

Additional Notes:

The organic layer of this soil ranged from 8 to 16 inches in thickness.

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol:	<u>546B</u> P
Map Unit Name:	Walpole sandy loam, 0-8% slopes
Landscape Settings:	This soil type is found in the concave and nearly level areas of the property.
Surface Features:	The areas with this soil type comprise ____ of the wetland areas found on this property.
Drainage Class:	Poorly Drained
Parent Material:	Very deep, sandy soils formed in water-sorted glacial outwash and stratified drift.
Complex:	Yes (<input type="checkbox"/>) No (<input type="radio"/>)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Areas of dissimilar inclusions consist of small areas where the depth to the seasonal high water is 12 to 15 inches in depth. This area encompasses no more than 5% of this map unit.

Additional Notes:

This poorly drained soil map unit borders the very poorly drained Scarboro series of the wetland drainage that runs through the site. Other areas with this soil type include the drainage ways that run along side of the paved road.

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 699C

Map Unit Name: Urban Land, pavement, 8-15% slopes

Landscape Settings: This unit is basically the sloping section of the road.

Surface Features: Hot Top Pavement.

Drainage Class: Impervious Surface

Parent Material: Anthropogenic/Hot Top

Complex: Yes () No (☐)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

N/A

Additional Notes:

N/A

SITE SPECIFIC SOIL MAP UNIT DESCRIPTIONS

Map Unit Symbol: 41B
Rk

Map Unit Name: Chatfield-Hollis-Rock Outcrop Complex, 0-8% slopes

Landscape Settings: This soil type is found dominantly at the highest points of the property.

Surface Features: The areas with this map unit exhibit moderately deep soils interspersed with shallow soils and areas of exposed bedrock.

Drainage Class: Well Drained

Parent Material: The Chatfield portion of this map unit has developed in 20 to 40 inches of glacial till overlying bedrock. The Hollis portion of this map unit has developed in a thin mantle of glacial till. The exposed bedrock areas are found scattered irregularly.

Complex: Yes (☒) No (☐)

This complex consists of approximately 40% Chatfield Series, 30% Hollis Series and 30% Exposed Bedrock.

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Areas of dissimilar inclusions consist of small areas where slopes are greater than 8%. This area encompasses no more than 5% of this map unit.

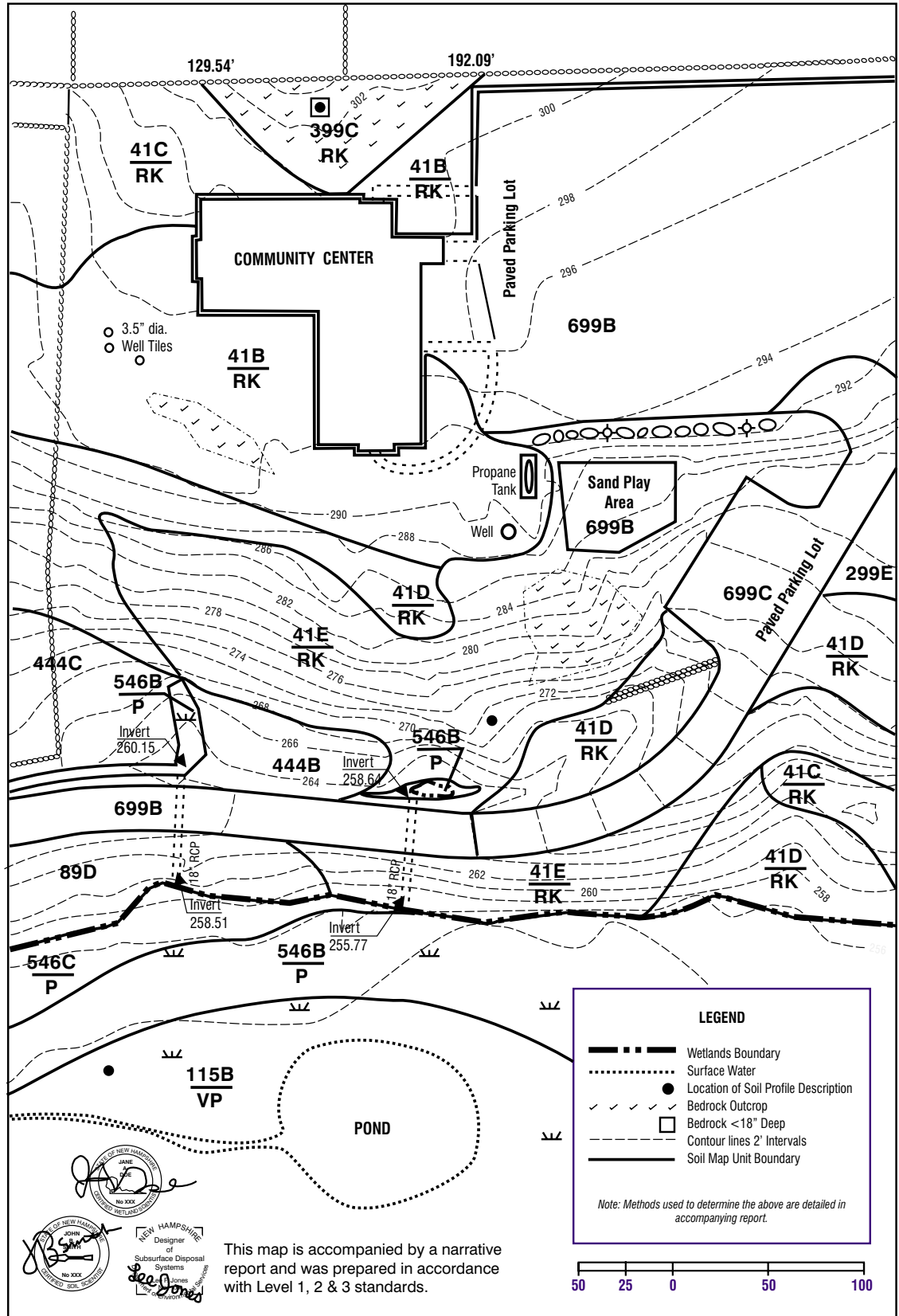
Additional Notes:

This soil complex is very variable due to the unpredictability of the undulating bedrock present in the area. Therefore some areas within this complex are bedrock controlled while other portions of this complex consist of moderately deep soils. The exposed areas of bedrock are irregularly scattered throughout this map unit.

SOIL GROUPINGS

Map Symbol	Map Unit	Soil Grouping
115	Scarboro	Group 6
546	Walpole	Group 5
699	Urban Land	Group 4
444	Newfields	Group 3
41	Chatfield/Hollis/Rock Outcrop	Group 4

Figure 6. Schematic Diagram of a Final Plan



V. Related Issues

In addition to the recommended information requirements outlined in the previous sections, three related issues deserve attention by municipalities. The first involves local regulations which determine lot sizes by soil types and the second addresses the variability of soil map units.

Application of Lot Size Calculations

In some cases, a municipality may be requiring large lots with the mistaken idea that a larger minimum lot size preserves open space. However, a large minimum lot size uses more acreage for a given number of housing units than does a smaller minimum or zoning that allows cluster development. The effect of large lot requirements is more rapid conversion of open space to residential uses as population growth increases housing demand.

In order to ensure that subsurface wastewater treatment systems function properly, many municipalities require that lot sizes are based on soil type. In these cases, a minimum lot size is typically required in the zoning ordinance with a reference to the subdivision regulations where additional area requirements are specified depending on soil characteristics.

The committee recommends that municipalities revise their local soil based lot size regulations to be consistent with NHDES' requirements according to RSA 485-A and Env-Ws 1000. NHDES will be revising their lot size tables to reflect the use of USDA/NRCS and site specific soil mapping standards. This will help to avoid confusion and provide for consistency of the regulatory requirements at the State and local levels. The tables used to determine the lot sizes by soil type often differ from one municipality to another, as well as from those required by NHDES for subdivision approval.

Variability of Soil Map Units

All maps and plots of areas on the earth's surface represent, at best, only an approximation of what is actually there. This is true regardless of what mapping scale or mapping standard is used. This truism applies to soil maps, as well. All soil map units contain inclusions of soils other than those used to name the map unit. These inclusions are expected and are described in the map unit description.

The exact extent of inclusions and their location within a map unit are nearly impossible to determine without spending an inordinate amount of time and expense on extremely small parcels of land. This characteristic of soils, however, does not detract from the usefulness of soils information for making informed land use decisions.

In order to adequately handle the natural variability of soil map units, soil mapping standards have been developed that require specific levels of purity based on the nature of the unmappable inclusions. These inclusions are identified in the map unit description, along with statements explaining their potential impact on use and management. Local regulatory board members should be familiar with reading soil maps and understand the nature of included soils and how their properties may affect a proposed land use.

It is also important to understand the placement of soil lines on a base map. Soil boundaries represent a transition in soil behavioral characteristics and do not necessarily represent the exact point on the landscape where a particular soil type suddenly changes to another. The variable width of this transitional area is particularly important to remember when determining the exact number of lots that will be allowed in a proposed subdivision, using soil-based lot size computations. For this reason, it may be desirable for a planning board to request the assistance of a soil scientist to review applications where significant questions about the soils have been raised.

VI. Sources and References

Chapter Env-Ws 415 of the NH Code of Administrative Rules - Permits for RSA 485-A:17 Activities, February, 1996

These are the State's administrative rules for significant alteration of terrain, involving earth disturbances greater than 100,000 square feet. The requirements are for stormwater management and erosion and sediment control. This threshold drops to 50,000 square feet within 250' of the shoreline of protected waters.

Department of Environmental Services (DES)
Public Information and Permitting
PO Box 95
Concord, NH 03301-0095
(603) 271-2975

Chapter Env-Ws 1000 of the NH Code Of Administrative Rules - Subdivision and Individual Sewage Disposal System Design Rules, February, 1997 (Currently Undergoing Revision)

These are the State's administrative rules for septic system design and permitting. By adopting these standards local consistency can be assured between State and local permitting processes. NHDES will continue to update these regulations as new developments in science and technology occur.

Department of Environmental Services (DES)
Public Information and Permitting
PO Box 95
Concord, NH 03301-0095
(603)271-2975

Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, 1987.

In combination with the regional field indicators of hydric soil, this manual is consistent with the NHDES Wetlands Bureau's administrative rules, Wt 100-800. The Corps Manual can be cited as one of the on-site wetland mapping standards in local subdivision and site plan review regulations.

US Department of the Army
Waterways Experiment Station, Corps of Engineers
PO Box 631
Vicksburg, MI 39180-0631

The Corps Manual can be downloaded over the Internet from the following address:
www.wes.army.mil/el/wetlands/pdfs/wlman87.pdf

Field Book for Describing and Sampling Soils: Version 1.1 National Soil Survey Center, NRCS, 1998.

This document summarizes the current National Cooperative Soil Survey's convention for describing soils. It describes instructions, concepts and codes in a field guide for making or reading soil profile descriptions as currently practiced in the United States.

The Field Book can be downloaded over the Internet from the following address:
www.statlab.iastate.edu/soils/nssc/field_gd/field_gd.htm

Field Indicators for Identifying Hydric Soils in New England, Version 2, New England Interstate Water Pollution Control Commission, 1998.

These field indicators of hydric soils were developed by an Interstate group of professionals, specifically to address New England soil conditions and landscapes. In combination with the 1987 Army Corps of Engineers Wetlands delineation manual, they are consistent with the Wetlands Bureau's administrative rules, Wt 100-800. They can be cited as one of the on-site wetland mapping standards in the local subdivision and site plan review regulations.

New England Interstate Water Pollution Control Commission (NEIWPCC)
Boott Mills South
Foot of John Street
Lowell, MA 01852-1102

Keys to Soil Taxonomy, Eighth Edition, USDA/NRCS, 1998.

This document summarizes the current National Cooperative Soil Survey's convention for classifying soils as currently practiced in the United States.

The Keys to Soil Taxonomy can be downloaded over the Internet from the following address:
www.statlab.iastate.edu/soils/keytax/keystosoiltaxonomy1998.pdf

Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999, or most recent revision.

This recent publication was prepared by the Society of Soil Scientists of Northern New England (SSSNNE) to supersede SSSNNE Publications No. 1 and 2, the HIS and Order 1 mapping standards, respectively. These standards result in multi-purpose map products that can be used for a number of land use purposes, including lot sizes. They can be adopted as site specific soil mapping standards as part of the local subdivision and site plan review regulations. They are consistent with the standards of the National Cooperative Soil Survey, which many local zoning ordinances are based upon.

Soil Science Society of Northern New England (SSSNNE)
PO Box 98
Durham, NH 03824-0098

Soil Manual for Site Evaluation in New Hampshire, 2nd Edition DES, 1991.

This publication was prepared by DES in cooperation with the NRCS to provide permitted designers and installers with guidance for use in doing site evaluations for the permitting of subsurface wastewater treatment systems. It is an easy to understand basic primer on soils and site evaluation.

Department of Environmental Services (DES)
Public Information and Permitting
PO Box 95
Concord, NH 03301-0095
(603)271-2975

Stormwater Management and Erosion and Sediment Control for Urban and Developing Areas in New Hampshire, DES, RCCD, 1992.

This document contains technical standards for stormwater management in developing urbanized areas. They are consistent with the site specific standards required by DES for significant alteration of terrain in accordance with RSA 485-A:17.

Department of Environmental Services (DES)
Public Information and Permitting
PO Box 95
Concord, NH 03301-0095
(603)271-2975

VII. List of Methods and Standards to be Used, by Review Level

LEVEL 1: DELINEATION OF WETLANDS AND SURFACE WATERS

- Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, Environmental Laboratory, Department of the Army, 1987.
- Field Indicators for Identifying Hydric Soils in New England, Version 2, New England Interstate Water Pollution Control Commission, 1998.
- Chapters Wt 100-800 of the NH Code Of Administrative Rules, April 21, 1997.
- RSA 485 - A:2, XIV, NH Safe Drinking Water Act

LEVEL 2: CONFIRMATION OF COUNTY SOIL SURVEY MAPS AND IDENTIFICATION OF LIMITING SOIL FEATURES

Step A

- Data Requirements for Site Review: Guidance for Planning Boards, Appendix 1, OSP, 1999.

Step B

- Field Book for Describing and Sampling Soils: Version 1.1 National Soil Survey Center, NRCS, 1998. (To replace the dated, 1991 Soil Manual for Site Evaluation in New Hampshire, 2nd Edition).
- NRCS Official Series Description Sheets and/or published map unit descriptions USDA/NRCS
- Keys to Soil Taxonomy, Eighth Edition, USDA/NRCS, 1998.
- Site Specific Soil Mapping Standards for New Hampshire and Vermont Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999.

Step C

- Data Requirements for Site Review: Guidance for Planning Boards, Appendix 2, OSP, 1999.
- Keys to Soil Taxonomy, Eighth Edition, USDA/NRCS 1998.
- Site Specific Soil Mapping Standards for New Hampshire and Vermont Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3.

LEVEL 3: SITE SPECIFIC SOIL MAPPING STANDARDS (SSSMS) MAP

- Site Specific Soil Mapping Standards for New Hampshire and Vermont Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999.

APPENDIX 1.

SOIL COMPLEXES WITH DRAMATICALLY DIFFERENT CHARACTERISTICS

The following map units represent soil complexes currently recognized in the USDA, Natural Resources Conservation Service, Numerical State-Wide Soils Legend for New Hampshire. These are Order 2 soil map units commonly used in county soil surveys because the scale of mapping and the intricate pattern of the soil components do not allow for these soils to be recognized and mapped separately. The individual components of these map units are significantly different in their behavioral characteristics such that they warrant different land use interpretations. Except in unusual situations, the soil components can be separated and delineated using site-specific soil mapping standards and the applicant must provide Level 3 information whenever one of these map units occur on the property in question. Map units are listed in alphabetical order according to the predominant component.

Soil associations are not listed in this table. Soil associations are complexes of different soils recognized at the Order 3 level of mapping detail. The minimum size delineation in Order 3 mapping is fifty to several hundred acres in size. The subsequent level of mapping detail is not suitable for making the land-use decisions upon which this guidance document is based.

Map Symbol	Map Unit Name
149	Acton and Acton firm substratum, very stony
148	Acton and Acton firm substratum
290	Acton Variant-Lyman Variant complex
771	Berkshire and Mondnock soils, extremely bouldery
365	Berkshire and Mondnock soils, extremely stony
364	Berkshire and Mondnock soils, very stony
273	Berkshire-Monadnock, and Hermon soils, extremely bouldery
890	Bice-Millsite complex, very stony
162	Canaan-Berkshire complex, very stony
51	Canaan-Hermon complex, extremely rocky
50	Canaan-Hermon complex, very rocky
842	Canaan-Rock outcrop-Redstone complex
360	Cardigan-Kearsarge complex
361	Cardigan-Kearsarge-Rock outcrop complex
178	Charlton-Chatfield complex
256	Chatfield-Canton complex
257	Chatfield-Canton complex, extremely rocky
258	Chatfield-Canton complex, very rocky
40	Chatfield-Hollis complex
140	Chatfield-Hollis-Canton complex, very stony
250	Chatfield-Hollis-Montauk complex, very stony
41	Chatfield-Hollis-Rock outcrop complex
135	Chatfield Variant-Newfields complex
870	Elliotsville-Monson complex, very stony
833	Glebe-Saddleback-Sisk complex, very stony

660	Hollis-Bernardston complex
661	Hollis-Bernardston-Rock outcrop complex
82	Hollis-Canton complex
186	Hollis-Canton complex, extremely rocky
185	Hollis-Canton complex, very rocky
83	Hollis-Canton-Rock outcrop complex
174	Hollis-Charlton complex
179	Hollis-Charlton complex, extremely rocky
175	Hollis-Charlton complex, very rocky
176	Hollis-Charlton-Rock outcrop complex
693	Hollis-Charlton-Urban land complex
184	Hollis-Chatfield complex
120	Hollis-Gloucester complex
122	Hollis-Gloucester complex, extremely rocky
121	Hollis-Gloucester complex, very rocky
141	Hollis-Rock outcrop-Chatfield complex
362	Kearsarge-Cardigan Rock outcrop complex
891	Lanesboro-Macomber complex, very stony
548	Leicester-Ridgebury complex, very stony
544	Leicester-Walpole complex
545	Leicester-Walpole complex, very stony
260	Lombard-Tunbridge complex
461	Lyman Variant-Tunbridge Variant-Rock outcrop complex
70	Lyman-Berkshire complex
270	Lyman-Berkshire complex, extremely rocky
170	Lyman-Berkshire complex, very rocky
71	Lyman-Berkshire-Rock outcrop complex
52	Lyman-Hermon complex
152	Lyman-Hermon complex, extremely rocky
151	Lyman-Hermon complex, very rocky
53	Lyman-Hermon-Rock outcrop complex
920	Lyman-Marlow-Rock outcrop complex
187	Lyman-Mondanock complex, extremely rocky
188	Lyman-Monadnock-complex, very rocky
171	Lyman-Monadnock-Rock outcrop complex
271	Lyman-Rock outcrop-Berkshire complex
153	Lyman-Rock outcrop-Hermon complex
161	Lyman-Tunbridge-Rock outcrop complex
346	Lyme and Moosilauke soils
347	Lyme and Moosilauke soils, very stony
267	Lyme-Moosilauke complex
248	Lyme-Moosilauke complex, very stony
249	Lyme-Pillsbury complex, very stony

254	Monadnock and Hermon soils
255	Monadnock and Hermon soils, very stony
80	Monadnock-Lyman complex, very stony
81	Monadnock-Lyman-Rock outcrop complex
25	Ninigret-Windsor complex
181	Paxton-Chatfield complex
312	Quonset-Warwick complex
837	Ricker-Rock outcrop complex
826	Ricker-Rock outcrop-Saddleback complex
836	Saddleback-Glebe-Ricker complex, very stony
805	Saddleback-Houghtonville-Rock outcrop complex
650	Saddleback-Ricker complex, very stony
807	Saddleback-Rock outcrop-Houghtonville complex
446	Scituate-Newsfields complex
447	Scituate-Newfields complex, very stony
138	Shapleigh-Gloucester complex, extremely rocky
137	Shapleigh-Gloucester complex, very rocky
136	Shapleigh-Gloucester complex
480	Tunbridge Variant-Lyman Variant-Henniker complex, very stony
370	Tunbridge-Berkshire complex
60	Tunbridge-Berkshire complex, very stony
670	Tunbridge-Berkshire-Lyman complex
90	Tunbridge-Lyman complex
380	Tunbridge-Lyman-Becket complex, very stony
160	Tunbridge-Lyman-Monadnock complex, very stony
471	Tunbridge-Lyman-Ricker complex
61	Tunbridge-Lyman-Rock outcrop complex
472	Tunbridge-Marlow complex
470	Tunbridge-Peru complex
560	Tunbridge-Plaisted-Lyman complex
561	Tunbridge-Plaisted-Lyman complex, very stony
114	Walpole-Binghamville complex
311	Warwick-Quonset complex
420	Waumbek and Skerry soils
421	Waumbek and Skerry soils, very stony
562	Winnecook-Thorndike-Rock outcrop complex

Human Influenced Soils

Human influenced soils recognized in county soil surveys typically are characterized as having extremely variable and altered soil material such that interpretations cannot be adequately applied without on-site investigations. The applicant must provide Level 3 information whenever one of these map units occurs on the property in question.

Map Symbol	Map Unit Name
698	Dumps
600	Endoaquents, loamy
900	Endoaquents, sandy
302	Made land
298	Pits, gravel and borrow
398	Quarries
300	Udipsamments, nearly level
350	Udipsamments, wet substratum
550	Udorthents, bedrock substratum
500	Udorthents, loamy
200	Udorthents, refuse substratum
400	Udorthents, sandy
299	Udorthents, smoothed
100	Udorthents, wet substratum

Source: NRCS, 1999

APPENDIX 2.

DEFINITIONS OF LIMITING FEATURES

Bedrock within 18" of the soil surface: "Soil surface" refers to the top of the first mineral layer. The bedrock meets the definition of either lithic or paralithic material. At least 75 percent of delineated areas must meet this definition with no more than 15 percent of the area having soil properties more limiting (i.e., hydric conditions). (Site-Specific Soil Mapping Standards for New Hampshire and Vermont, SSSNNE Special Publication No.3, June 1999, pp 6-7)

Lithic material: Unaltered material that is continuous, coherent and indurated.* The material qualifies for an "R" designation as a master layer (USDA Soil Survey Manual, 1993, pg. 121). Plant and tree roots cannot enter except in cracks. Hand digging with a spade is impractical. Some lithic material can be ripped with heavy power equipment. The material must be in a strongly cemented or more cemented rupture-resistance class. Granite, quartzite and indurated * limestone or sandstone are examples. (Keys to Soil Taxonomy, Eighth Edition, 1998, pg.32)

* Indurated: said of a rock or soil hardened or consolidated by pressure, cementation or heat. (Dictionary of Geological Terms, Bates and Jackson, 1984.)

Paralithic material: Relatively unaltered material that have an extremely weakly cemented to moderately cemented rupture-resistance class. The material qualifies for a "Cr" designation as a subordinate distinction within a master soil layer (USDA Soil Survey Manual, 1993, pg. 124). Cementation or bulk density are such that plant and tree roots cannot enter except in cracks. The material can be hand dug with a spade with much difficulty. Commonly these materials consist of weathered or weakly consolidated bedrock. (Keys to Soil Taxonomy, Eighth Edition, 1998, pg.32)

Bedrock outcrop: Lithic or paralithic material exposed at the surface.

Steep slopes greater than 35 percent: At least 75 percent of delineated areas must meet this definition. (Site-Specific Soil Mapping Standards for New Hampshire and Vermont, SSSNNE Special Publication No.3, June 1997, pp 6-7)

Very poorly drained soil:

Soils that are flooded daily by tides

Soils that have aquic conditions within the upper part **and**
have an organic surface layer greater than 16 " thick, **or**

Have an organic surface layer 8" to 16" thick **and**
are directly underlain by a depleted or gleyed matrix.

Have an organic surface layer 4" to 8" thick, **or**
a mucky A or Ap horizon **and**

are directly underlain by a depleted or gleyed matrix

Do not have a spodic horizon; dominant texture in upper 20" is loamy fine sand or coarser **and**
have an organic surface layer 4" to 8" thick, or mucky A or Ap directly underlain with
5 percent or more redox features.

Sources: Keys to Soil Taxonomy, Eighth Edition, 1998; Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 2.0, Society of Soil Scientists of Northern New England Publication No. 3, 1999, or most recent revision.

Appendix 3.

THREE EXAMPLES OF SUGGESTED DOCUMENTATION FOR NRCS MAP CONFIRMATION

Insert map here

Example #1. Proposed Subdivision of 8 Acres

Soil map units on the NRCS soil survey:

PaB - Paxton fine sandy loam, 3 to 8 percent slopes

PaC - Paxton fine sandy loam, 8 to 15 percent slopes

Summary Report:

The NRCS published soil survey and supporting soil series description describes this 8 acre parcel as being comprised of very deep, well drained loamy glacial till with a hardpan occurring about 40 inches. A perched watertable occurs above the hardpan for brief periods of time. Slopes range from 3 to 15 percent.

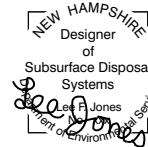
Three soil descriptions were completed on the parcel. One in the PaB map unit and two in the PaC map unit. Based on three soil descriptions, the NRCS published soil survey adequately reflects the nature and properties of the soils on the site. Indications of a perched watertable were not observed in locations #1 and #3, and the observations indicate the depth to hardpan, in some areas, is slightly below the range allowed for the Paxton Series. These features, however, do not impact on the intended use and management of the parcel.

The soils were not described below a reasonable depth after reaching the hard pan. There is no bedrock mapped, observed or expected in the immediate area and deeper investigations were deemed to be unnecessary to adequately describe the nature and properties of the soils within the parcel.

Based on the soil observations made, the NRCS soil survey adequately represents the area for the intended use and a site-specific soil survey is not warranted.

Date

Signature and Seal



(Total estimated time, on-site, to conduct soil investigations and write narrative report: 2 hours)

SOIL DESCRIPTION #1

Horizon	Depth	Matrix Color	Percent Redox	Texture	Consistence	Permeability	Comments
Ap	0-7"	10yr3/3		fsl	friable	moderate l	
Bw1	7-24"	2.5y4/4		fsl	very firm	moderate	
Cd	24-30"	5Y5/3		grfsl	friable	slow	

Comparison of Soil Characteristics:

	Slope	Drainage	SHWT & Type	Textures	Depth to Restrictive Feature	Comments
As described in soils report and/or OSD:	3-8%	Well Drained	18-40 inches; perched	Loamy	Hardpan at 18 to 40 inches	
As observed in test pit log:	3%	Well Drained	None observed	Loamy	Hardpan observed at 24 inches	Test pit supports soil as mapped; no evidence of a SHWT

SOIL DESCRIPTION #2:

Horizon	Depth	Matrix Color	Percent Redox	Texture	Consistence	Permeability	Comments
Ap	0-5"	10yr3/1		fsl	friable	moderate l	
Bw1	5-15"	10YR5/4		fsl	friable	moderate	
Bw2	15-42"	2.5y4/4		Grfsl	friable	moderate	
Bw3	42-44"	2.5y4/4	5% 7.5yr5/6	grfsl	friable	moderate	
Cd	44-50"	5Y5/3	5% 7.5				Depth to hard pan outside range by 4"

Comparison of Soil Characteristics:

	Slope	Drainage	SHWT & Type	Textures	Depth to Restrictive Feature	Comments
As described in soils report and/or OSD:	15-25%	Well Drained	18-40 inches; perched	Loamy	Hardpan at 18 to 40 inches	
As observed in test pit log:	9%	Well Drained	42" perched	Loamy	Hardpan observed at 44 inches	Depth to hardpan and depth to shwt outside range.

SOIL DESCRIPTION #3

Horizon	Depth	Matrix Color	Percent Redox	Texture	Consistence	Permeability	Comments
A	0-2"	10yr3/3		fsl	friable	moderate l	
Bw1	2-20"	2.5y4/4		fsl	friable	moderate	
BW2	20-45"	5Y5/3		grfsl	friable	slow	
Cd	45-47"	5Y5/3		grfsl	very firm	very slow	Hardpan outside range by 5"

Comparison of Soil Characteristics:

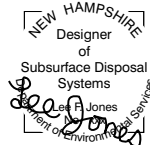
	Slope	Drainage	SHWT & Type	Textures	Depth to Restrictive Feature	Comments
As described in soils report and/or OSD:	15-25%	Well Drained	18-40 inches; perched	Loamy	Hardpan at 18 to 40 inches	
As observed in test pit log:	18%	Well Drained	None observed	Loamy	Hardpan observed at 45 inches	Hardpan outside range by 5", no evidence of a SHWT

Soil map units on the NRCS soil survey:

Summary Report:

Observations of bedrock outcropping were observed while traversing this parcel. Two soil descriptions were completed. One in an area of deep soils; the other in an area of poorly drained soils associated with the wet spot symbol. An area in the northeast corner of the parcel, indicated with the wet spot symbol, has already been delineated on the site plan as wetland. The wetland boundary, as shown on the site plan, may not necessarily represent the boundary of hydric soil.

Date



(Total estimated time, on-site, to conduct soil investigations and write narrative report: 1 hour)

SOIL DESCRIPTION #1

Horizon	Depth	Matrix Color	Percent Redox	Texture	Consistence	Permeability	Comments
A	0-2"	10yr3/3		fsl	friable	moderate l	
Bw1	2-20"	10yr5/4		fsl	friable	moderate	
Bw2	20-45"	2.5y4/4		grfsl	friable	moderate	
C1	45-47"	5Y5/3		l	friable	moderate	
C2	47-55"	5y5/3		l with ls lenses	friable to loose	moderately rapid	Stopped by large stone at 55"

Comparison of Soil Characteristics:

	Slope	Drainage	SHWT & Type	Textures	Depth to Restrictive Feature	Comments
As described in soils report and/or OSD: Hollis Component:	8-15%	Somewhat excessive	none	Loamy	Bedrock at 10 to 20 inches	
Charlton Component	8-15%	Well Drained	none	Loamy	None above 65"	Test pit supports soil as mapped; no evidence of a SHWT
As observed in test pit log:	12%	Well Drained	none observed	Loamy	None observed	Fits concept of the Charlton Series

SOIL DESCRIPTION #2:

Horizon	Depth	Matrix Color	Percent Redox	Texture	Consistence	Permeability	Comments
A	0-6"	10yr3/2		fsl	friable	moderate l	
Bw1	6-12"	10yr5/4	10yr5/2 7.5yr5/6	fsl	friable	moderate	
Bw2	12-22"	2.5y4/4	10yr5/2 10yr6/1 7.5yr5/6	grfsl	friable	moderate	Watertable observed at 20"
Cg1	22-35+	2.5y6/2	7.5yr5/6	l	friable		

Comparison of Soil Characteristics: None

Soil Description taken in vicinity of special features symbol.

Example #3. Proposed Subdivision of 10 Acres

Soil map units on the NRCS soil survey:

PaB - Paxton fine sandy loam, 3 to 8 percent slopes

PdD - Paxton very stony fine sandy loam, 15 to 25 percent slopes

Summary Report:

The NRCS published soil survey and supporting soil series descriptions, describes this 10 acre parcel as being comprised of very deep, well drained loamy glacial till with a hardpan occurring above 40 inches. A perched water table occurs above the hardpan for brief periods of time. Slopes range from 3 to 25 percent.

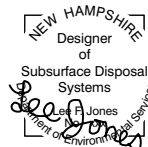
During the site visit an area was observed within the open field, located in the western half of the parcel, that can be characterized as having slopes of 8 to 15 percent. This is a mappable area at the scale of the subdivision plan and represents a new soil delineation, this area should be identified for proper soil based lot size calculation.

Because a new soil map unit must be recognized, subsequently altering existing soil lines on the county soil survey, a site-specific soil survey is warranted.

No soil descriptions were taken during this on-site review.

Date

Signature and Seal



(Total estimated time, on-site, to conduct soil investigations and write narrative report: ½ hour)